Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

1. (currently amended) A method generating stimuli by an auditory prosthesis, including an array of stimulation devices, in response to an incoming acoustic signal, the method including:

determining stimulation devices to be activated within the array and activation times for those stimulation devices ~~electrodes~~; and

applying a temporal adjustment to the activation times such that activation of stimulation devices representing lower-amplitude components of the signal is delayed relative to activation of a proximate device representing a higher-amplitude component of the signal.

2. (original) A method according to claim 1, wherein the auditory prosthesis is implantable in a cochlea and forms a linear array.

3. (currently amended) A method according to claim 1, wherein the auditory prosthesis stimulation device ~~electrode~~ array is implantable in an auditory brain and forms a grid mapped to the form of a linear array .

4. (currently amended) A method according to ~~any one of the preceding claims~~ claim 1, wherein the temporal adjustment applied to the activation time of stimulation device is derived from the amplitudes of stimuli to be applied by proximate stimulation devices.

5. (original) A method according to claim 4, wherein the activation time of each stimulation device is temporally adjusted according to a latency function whereby, for a particular device, a temporal adjustment is applied if the weighted sum of the amplitudes of proximate stimuli exceeds the weighted amplitude of the stimuli to be applied by the particular device.

6. (original) A method according to claim 5, wherein the latency function defines a Mexican-hat shape centred on the stimuli to be applied by the proximate device, with the restriction of being limited to a minimum of no delay.

7. (original) A method according to claim 6, wherein the latency function $f_x(\vec{x})$ is defined by:

$$f_x(\vec{x}) = \min(0, -2aA_x + a\sum_{\substack{y=1 \\ y \neq x}}^{N} g(y)A_y)$$

where A_x is the amplitude of a stimulation to be applied by a device x, a is a scaling factor, N is the number of devices

to which the latency function is constrained, and $g(y)$ is amplitude of a stimuli applied by device y.

8. (currently amended) A method according to ~~any one of the preceding claims~~ claim 1, wherein the stimulation device ~~electrode~~ array of the auditory prostheses requires non-simultaneous stimulation to be applied by the array of stimulation devices, the method further including:

if there is temporal contention between stimulation to be applied by different devices of the array, discarding one or more lower-amplitude stimuli in favour of a higher-amplitude stimulus.

9. (currently amended) A method according to ~~any one of claims 1 to 7~~ claim 1, wherein the auditory prostheses requires non-simultaneous stimulation to be applied by the array of stimulation devices, the method further including:

if there is temporal contention between stimulation to be applied by different devices of the array, applying a further temporal delay to one or more lower-amplitude stimuli by one or more stimulation slots in favour of a higher-amplitude stimulus.

10. (currently amended) A method according to ~~any one of the preceding claims~~ claim 1, wherein array of stimulation devices

includes one or more electrodes, each electrode being activated by the application of a stimulation pulse.

11. (currently amended) A method according to ~~any one of claims 1 to 9~~ claim 1, wherein the array of stimulation devices includes one or more drug delivery units for the delivery of drugs to a user at predetermined locations.

12. (original) A method according to claim 11, wherein the drug delivery units are fluidic microchannels.

13. (currently amended) A system for generating stimuli for applications by an auditory prosthesis including an array of stimulation devices, including:

a stimulator unit for selectively activating stimulation devices in the array; and

a processor for processing received sound signals and controlling the operation of the stimulator unit ~~by carrying out a method according to any one of claims 1 to 12~~ using a method including:

determining stimulation devices to be activated within the array and activation times for those stimulation devices; and

applying a temporal adjustment to the activation times such that activation of stimulation devices representing lower-amplitude components of the signal is delayed relative

to activation of a proximate device representing a higher-amplitude component of the signal.

14. (currently amended) A system ~~according to claim 13 when dependent on claim 10~~ for generating stimuli for applications by an auditory prosthesis as claimed in claim 22, wherein the stimulator unit acts to activate the one or more electrodes by selectively applying stimulation pulses to the electrodes.

15. (currently amended) A system according to claim ~~13 when dependent on either one of claims 11 or 12~~ 23, wherein the stimulator unit includes a drug storage device and a drug delivery pump for delivering drugs stored in the drug storage device through the drug delivery units to a user.

16. (currently amended) A processor for use in a system for generating stimuli for application by an auditory prosthesis including an array of stimulation devices, the system including a stimulator unit for selectively activating stimulation devices in the stimulation device ~~electrode~~ array, the processor including digital signal processing means for processing received sound signals and controlling the operation of the stimulator unit using a method including:

determining stimulation devices to be activated within the array and activation times for those stimulation devices; and

applying a temporal adjustment to the activation times such that activation of stimulation devices representing lower-amplitude components of the signal is delayed relative to activation of a proximate device representing a higher-amplitude component of the signal.

17. (new) A system for generating stimuli for applications by an auditory prosthesis as claimed in claim 13 wherein the activation time of each stimulation device is temporally adjusted according to a latency function whereby, for a particular device, a temporal adjustment is applied if the weighted sum of the amplitudes of proximate stimuli exceeds the weighted amplitude of the stimuli to be applied by the particular device.

18. (new) A system for generating stimuli for applications by an auditory prosthesis as claimed in claim 17 wherein the latency function defines a Mexican-hat shape centred on the stimuli to be applied by the proximate device, with the restriction of being limited to a minimum of no delay.

19. (new) A system for generating stimuli for applications by an auditory prosthesis as claimed in claim 18, wherein the latency function $f_x(\vec{x})$ is defined by:

$$f_x(\vec{x}) = \min(0, -2aA_x + a\sum_{\substack{y=1 \\ y \neq x}}^{N} g(y)A_y)$$

where A_x is the amplitude of a stimulation to be applied by a device x, a is a scaling factor, N is the number of devices to which the latency function is constrained, and $g(y)$ is amplitude of a stimuli applied by device y.

20. (new) A system for generating stimuli for applications by an auditory prosthesis as claimed in claim 13, wherein the stimulation device array of the auditory prostheses requires non-simultaneous stimulation to be applied by the array of stimulation devices, and wherein the processor is further configured to discard one or more lower-amplitude stimuli in favour of a higher-amplitude stimulus, in the event that there is temporal contention between stimulation to be applied by different devices of the array.

21. (new) A system for generating stimuli for applications by an auditory prosthesis as claimed in claim 13, wherein the auditory prostheses requires non-simultaneous stimulation to be applied by the array of stimulation devices, and the processor is further configured to apply a further temporal delay to one or more lower-amplitude stimuli by one or more stimulation slots in favour of a higher-amplitude stimulus, in

the event that there is temporal contention between stimulation to be applied by different devices of the array.

22. (new) A system for generating stimuli for applications by an auditory prosthesis as claimed in claim 13 wherein array of stimulation devices includes one or more electrodes, each electrode being activated by the application of a stimulation pulse.

23. (new) A system for generating stimuli for applications by an auditory prosthesis as claimed in claim 13 wherein the array of stimulation devices includes one or more drug delivery units for the delivery of drugs to a user at predetermined locations.

24. (new) A system for generating stimuli for applications by an auditory prosthesis as claimed in claim 13 wherein the auditory prosthesis is implantable in a cochlea and forms a linear array.

25. (new) A system for generating stimuli for applications by an auditory prosthesis as claimed in claim 13 wherein the auditory prosthesis stimulation device array is implantable in an auditory brain and forms a grid mapped to the form of a linear array.

26. (new) A system for generating stimuli for applications by an auditory prosthesis as claimed in claim 13 wherein the processor is further configured to apply a the temporal adjustment to the activation time of stimulation device derived from the amplitudes of stimuli to be applied by proximate stimulation devices.

27. (new) A processor for use in a system for generating stimuli for application by an auditory prosthesis as claimed in claim 26, wherein the processor is further configured to apply a the temporal adjustment to the activation time of stimulation device derived from the amplitudes of stimuli to be applied by proximate stimulation devices.

28. (new) A processor for use in a system for generating stimuli for application by an auditory prosthesis as claimed in claim 26, wherein the processor is further configured to discard one or more lower-amplitude stimuli in favour of a higher-amplitude stimulus, in the event that there is temporal contention between stimulation to be applied by different devices of the array.

29. (new) A processor for use in a system for generating stimuli for application by an auditory prosthesis as claimed in claim 26, wherein the processor is further configured to

apply a further temporal delay to one or more lower-amplitude stimuli by one or more stimulation slots in favour of a higher-amplitude stimulus, in the event that there is temporal contention between stimulation to be applied by different devices of the array.